

IN THE CLAIMS:

1. (Currently Amended) A non-blocking crossbar, comprising:

n inputs, n numbering at least two;

n outputs, each of said outputs having a destination first-in, first-out buffer (FIFO) and

n crossbar FIFOs, wherein each of said n crossbar FIFOs interposes a corresponding one of
each of said n inputs interposing corresponding ones of said n inputs and said destination
FIFO, wherein each of said n interposing crossbar FIFOs is unique to one of said n outputs;

and

a scheduler configured to cause a plurality of packets that are unencapsulated,

unsegmented and of differing lengths to be transmitted from one of said inputs toward one of
said outputs only when both said destination FIFO associated therewith and an interposing one
of said crossbar FIFOs have sufficient memory at a same time to receive, and then contain an
entirety of a packet of said plurality of packets.
2. (Original) The non-blocking crossbar as recited in Claim 1 wherein said scheduler
is further configured to select one of said inputs based upon a priority thereof.
3. (Original) The non-blocking crossbar as recited in Claim 1 wherein said scheduler
is further configured to select one of said outputs based upon a priority thereof.
4. (Original) The non-blocking crossbar as recited in Claim 1 wherein at least two of
said n inputs are coupled to different types of packet based fabrics.

5. (Previously presented) The non-blocking crossbar as recited in Claim 1 wherein a first input and a first output is coupled to a SONET network, a second input and a second output is coupled to a Gigabit Ethernet network, and a third input and a third output is coupled to another Gigabit Ethernet network.

6. (Previously Presented) The non-blocking crossbar as recited in Claim 1 wherein each of said outputs further comprises an output arbiter configured to select one of said crossbar FIFOs and transfer a packet therein to said destination FIFO.

7. (Original) The non-blocking crossbar as recited in Claim 6 wherein said output arbiter is further configured to select said one of said crossbar FIFOs based upon packet priority.

8. (Currently Amended) A method of operating a non-blocking crossbar, comprising:

employing n inputs, n numbering at least two;

employing n outputs, each of said outputs having a destination first-in, first-out buffer (FIFO) and n crossbar FIFOs, wherein each of said n crossbar FIFOs interposes a corresponding one of each of said n inputs ~~interposing corresponding ones of said n inputs and~~ said destination FIFO, wherein each of said n interposing crossbar FIFOs is unique to one of said n outputs; and

scheduling a plurality of packets that are unencapsulated, unsegmented and of differing lengths to be transmitted from one of said inputs toward one of said outputs only when both said destination FIFO associated therewith and an interposing one of said crossbar FIFOs have sufficient memory at a same time to receive, and then contain an entirety of a packet of said plurality of packets.

9. (Previously presented) The method as recited in Claim 8 wherein said scheduling further comprises selecting one of said inputs based upon a priority thereof.

10. (Original) The method as recited in Claim 8 wherein said scheduling further comprises selecting one of said outputs based upon a priority thereof.

11. (Original) The method as recited in Claim 8 wherein at least two of said n inputs are coupled to different types of packet based fabrics.

12. (Previously presented) The method as recited in Claim 8 wherein a first input and a first output is coupled to a SONET network, a second input and a second output is coupled to a Gigabit Ethernet network, and a third input and a third output is coupled to another Gigabit Ethernet network.

13. (Previously Presented) The method as recited in Claim 8 further comprising selecting one of said crossbar FIFOs and transferring a packet therein to said destination FIFO.

14. (Original) The method as recited in Claim 13 wherein said selecting further comprises selecting said one of said crossbar FIFOs based upon packet priority.

15. (Currently Amended) A multi-channel network line card for packet based networks, comprising:

n physical interfaces, n numbering at least three;

n network processors that converts a packet between protocols, each of said network processors coupled to corresponding ones of said n physical interfaces; and

a non-blocking crossbar coupled to said network processors and said physical interfaces, including:

n inputs that receive said packet from corresponding ones of said n network processors,

n outputs that transmit said packet to corresponding ones of said n physical interfaces, each of said outputs having a destination first-in, first-out buffer (FIFO) and n crossbar FIFOs, wherein each of said n crossbar FIFOs interposes a corresponding one of each of said n inputs ~~interposing corresponding ones of said n inputs~~ and said destination FIFO, wherein each of said n interposing crossbar FIFOs is unique to one of said n outputs, and

a scheduler that causes a plurality of unencapsulated, unsegmented packets that are of differing lengths to be transmitted from one of said inputs toward one of said outputs only when both said destination FIFO associated therewith and an interposing

one of said crossbar FIFOs have sufficient memory at a same time to receive, and then contain an entirety of a packet of said plurality of packets.

16. (Previously presented) The multi-channel network line card as recited in Claim 15 wherein said network processors further include:

a fast pattern processor that receives said packet from corresponding ones of said n physical interfaces, said fast pattern processor analyzes and classifies said packet; and

a routing switch processor that processes said packet classified by said fast pattern processor, performs traffic management and converts said packet into an appropriate network protocol.

17. (Original) The multi-channel network line card as recited in Claim 15 wherein said scheduler selects one of said inputs based upon a priority thereof and selects one of said outputs based upon a priority thereof.

18. (Original) The multi-channel network line card as recited in Claim 15 wherein at least two of said n inputs are coupled to different types of packet based networks.

19. (Previously presented) The multi-channel network line card as recited in Claim 15 wherein a first physical interface is coupled to a SONET network, a second physical interface is coupled to a Gigabit Ethernet network, and a third physical interface is coupled to another Gigabit Ethernet network.

20. (Original) The multi-channel network line card as recited in Claim 15 wherein each of said outputs further comprises an output arbiter configured to select one of said crossbar FIFOs based upon packet priority and transfer a packet therein to said destination FIFO.